Responses to Comments on the Field Change Request-006, Strontium-90 Analytical Method Update, dated September 9, 2021	
Comments by: Wayne Praskins, U.S. Environmental Protection Agency, comments dated September 22, 2021	
Comments	**Response**
1. In Tuesday's call the Navy asked for agency feedback by COB today on its proposed Field Change Request (FCR) #6 on the Parcel G work plan. As originally drafted, the FCR proposed: i) changes to the laboratory analytical method for strontium-90 in soil (larger sample mass and longer ingrowth period), ii) new decision criteria for interpreting results generated when a sample is recounted or additional aliquots from a sample are analyzed, and iii) reanalyzing all of the Parcel G soil samples previously analyzed for Sr-90 using the improved laboratory method. The Navy explained on Tuesday that in response to feedback from the agencies the Navy intends to drop the proposed decision criteria. We support this change. We also support the proposed changes to the laboratory method to reduce the minimum detectable concentration and uncertainty in the Sr-90 results. The proposed FCR does not describe how the results generated by reanalyzing previously collected Parcel G soil samples will be used in relation to the existing results. We do not object to reanalyzing previously collected samples but would not support, in the absence of convincing evidence, using the new data to supersede existing results. Before any new data are generated, we ask for the opportunity to provide input on Navy plans for comparing new and existing data, including plans for any statistical tests.	The field change request (FCR) was revised to remove the decision criteria. As discussed with the agencies in meetings on July 13, 2021 and August 16, 2021, the sample result uncertainties are higher than expected. For strontium-90 (Sr-90) sample results received to date, the total uncertainty has ranged from 0.106 to 0.430 pCi/g and the decision level concentration (DLC) has ranged from 0.0872 to 0.325 pCi/g. The higher-than-expected uncertainty coupled with the DLC approach, and in some cases exceed, the value of the remediation goal (RG) of 0.331 pCi/g. Based on the sample results uncertainties, the current Sr-90 sample preparation method is not optimal for analyzing samples and making project decisions based on a RG of 0.331 pCi/g. The Navy intends to reanalyze project samples for Sr-90 using the proposed sample preparation method. The proposed method is expected to reduce sample uncertainty and the DLC, reducing the chance for false positives above the 0.331 pCi/g RG. However, the revised Sr-90 protocol does not eliminate the potential for false positives at a reliability level of 5 percent probability of error in each sample. Therefore, as described in Worksheet 37 of the SAP (Appendix B of the Parcel G Work Plan [June 2019]), a data quality assessment (DQA) will be conducted as the last phase of the data collection process and consists of a scientific and statistical evaluation to assess data usability. The DQA will include, for example, reviewing the data quality objectives, conducting a preliminary data review (e.g., reviewing QA reports, conducting statistical quantities, and graphing the data), selecting and conducting statistical tests if appropriate, verifying the assumptions of the statistical test, and drawing conclusions. These activities are further defined in MARSSIM (Section 8 and Appendix E) and EPA Guidance for DQA. The Navy will use the results analyzed by the proposed method to make project decisions. The Navy will compare new and existing data following receipt of the data and report the comparison methods and results to the agencies. The Navy will continue discussions with the agencies on the plans for comparing new and existing data, including plans for any statistical tests if appropriate, but

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	will move forward with the reanalysis of Sr-90 once the Navy finalizes FCR-006.

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1. **Section Reason for Change:** "*The measurement uncertainty resulted in a discussion with the Navy and regulatory agencies to evaluate method improvements to lower uncertainty and the DLC…… This preparation method for Sr-90 uses a larger aliquot (2.5 grams) with HNO3/HCl digestion and Eichrom resin (Sr Resin) separation, with a 14-day ingrowth and gas flow proportional counting (GFPC) detection.*" CDPH agrees the larger aliquot size and the longer ingrowth period would be helpful to lower the uncertainty value of Strontium analytical results. Furthermore, CDPH believes it is more vital to set an upper limit on the uncertainty value of individual Strontium analysis in order to ensure the individual result can be compared directly with Navy's established remedial goal (RG), without ambiguity. CDPH requires that the laboratory to optimize multiple factors, including but not limited to aliquot size, ingrowth time, count time, chemical yield etc., that can potentially lower the uncertainty value. That way the soil sample result (concentration +/- uncertainty) are either below or above the established RG. CDPH also recommends applying this method of limiting uncertainty value to all the Radionuclides of Concern (ROCs) concentration analysis for Hunters Point Parcel G Rework.	The Navy is not adding decision criteria based on sample uncertainty values. There is no precedent at Hunters Point Naval Shipyard for decision criteria based on sample uncertainties. Uncertainty will be evaluated on a case-by-case basis because it is calculated for each sample. The laboratory runs methods in accordance with their approved standard operating procedure (SOP) which sets parameters for aliquot size, ingrowth time, count time, and chemical yield. The proposed method includes the improvements to reduce the decision level concentration and uncertainty. This proposed method is only applicable for Sr-90. The Navy has not observed higher-than-expected uncertainty values impacting project decisions in analysis for other radionuclides of concern. The Navy does not intend to limit uncertainty values.
2. **Section Reason for Change:** "*Previous samples will be reanalyzed using this sample preparation.*" CDPH supports Navy's proposal of reanalyzing previous samples with the sample preparation described in this FCR-006. However, the data collected with modified sample preparation and analysis methods described in this FCR-006 will not invalidate the original data set.	Please refer to the response to U.S. Environmental Protection Agency Comment 1.
3. **Section Reason for Change:** "*In addition to the changes in analytical method discussed above in this FCR, to fully comply with the requirements outlined in WP Section 5.3.2 and confirm sample results that indicate a potential area of elevated activity, confirmation of sample results with elevated activity will include the following*: • *Sr-90 results will immediately (to the maximum extent practical) be recounted by the laboratory.* • *If the recounted sample is below the RG, then the initial result will be considered a false positive.*	The field change request (FCR) was revised to remove the decision criteria. Work Plan Section 5.3 discusses investigation of potential areas of elevated activity. Sample results with elevated Sr-90 activity that exceed the RG will be recounted by the laboratory immediately (to the maximum extent practical) to confirm the sample results.

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• *If a recount of the sample is not possible, or the recount sample result exceeds the RG, two (2) additional aliquots will be collected from the sample and analyzed for Sr-90.* • *If the results of both additional aliquots are below the RG, then the original result will be considered a false positive. If either one of the two additional aliquot results is above the RG, then the sample will be considered an exceedance.*" CDPH does not concur with the steps listed in the bullet points as a method of "confirmation of sample results with elevated activity". These steps described in the bullet points are not consistent with "a point-by-point comparison with the statistically-based RG" described in Section 3.1 in the Final Parcel G Removal Site Evaluation Work Plan, Former Hunters Point Naval Shipyard, San Francisco, CA (WP). CDPH strongly recommends completely removing the section discussing the confirmation of sample results with elevated activity.	
4. Attachment: SOP No. ST-RC-0058, Rev. 7, Page 2 of 15: "*This SOP is based on ASTM Method C1507-07 and Eichrom Method SRW01.*" ASTM method C1507-07 is designed for the analysis of 10 grams of soil, while FCR-006 proposes to analyze 2.5 grams. Please explain the reason for proposing a different aliquot weight in the FCR-006 compared to what is recommended in ASTM Method C1507-07.	The Navy is proposing SOP No. St-RC-0058, which is based on ASTM Method C1507-07. The Navy is not proposing ASTM Method C1507-07 as the preparation method. The sample size included in ASTM Method C1507-07 is not relevant to SOP No. St-RC-0058. SOP No. St-RC-0058 uses an aliquot size of 2.5 grams. The more sample mass that is used for analysis, the more matrix interference is possible, potentially causing other laboratory quality control challenges. In addition, the separation resin column only has a certain capacity of Sr that it can bind. Therefore, a larger sample size can overwhelm the resin column. The laboratory method validation and certification are for a 2.5 gram sample aliquot. Laboratory SOPs are certified with the Department of Defense and Department of Energy.